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ORIGINAL ARTICLES.

A CASE OF SO-CALLED IRIDOCYCLITIS SEROSA WITH SECONDARY GLAUCOMA.

By Adolf Alt, M.D.,*

ST. LOUIS, MO.

Among a larger number of eyes which were given me by a friend for pathological studies there was one labelled *iridocyclitis serosa with secondary glaucoma.* Being preserved in formol, the cornea of this eye was still sufficiently clear to show plainly the well known triangular deposit on the posterior surface of the cornea.

The macroscopical examination of the very darkly pigmented eye showed a deep glaucomatous cupping of the optic nerve and some point-like hæmorrhages between choroid and retina. The periphery of the iris was attached to the corneoscleral tissue in the usual manner. The ciliary body and iris were thin and atrophic. There were some pigment deposits on the anterior lens capsule evidently the remnants of former posterior synechiæ. While the triangular deposit on the back of the cornea was well marked, it was even macroscopically plain that much smaller but still visible deposits covered almost the whole posterior surface of this membrane. At the site of the ligamentum pectinatum and the venous plexus the corneoscleral tissue appeared pigmented.

*Demonstrated at the March Meeting of the St. Louis Ophthalmological Society.

On microscopical examination this eye showed such an array of peculiar changes that a detailed description of it seems worthy of record.

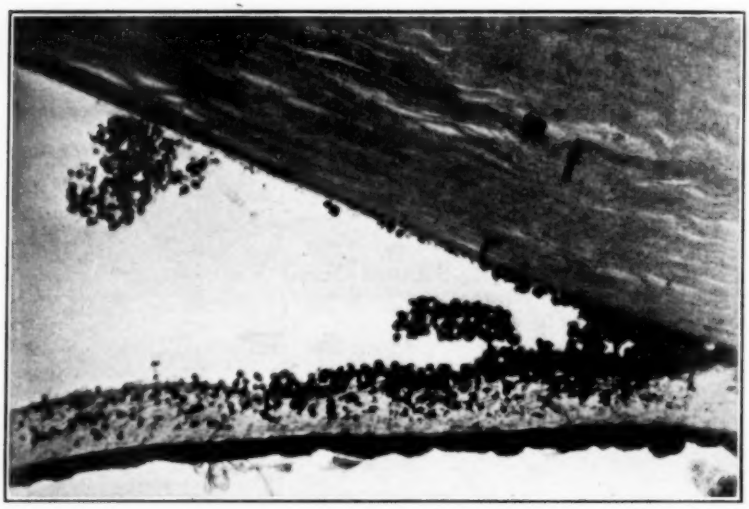

Fig. 1. Unbleached section of iris angle.

First, examining the iris angle, this was found to be filled with large round bodies of pigment (Fig. 1). The same round pigment bodies lie upon the posterior surface of the cornea for some distance, on the surface of the iris between the iris tissue

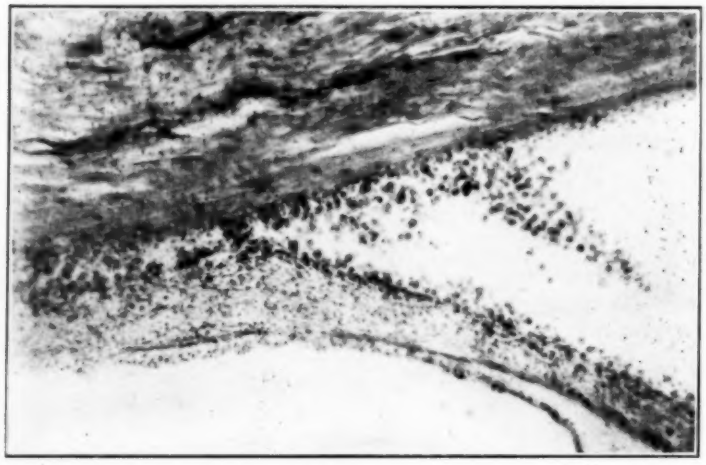

Fig. 2. Bleached section of iris angle, showing the epithelial cells in the iris angle, iris tissue and between iris and corneoscleral tissue where these adhere to each other.

trabeculæ, and between iris and corneoscleral tissue where these are attached to each other, and in the folds of the ciliary body. Some such pigment bodies fill the compressed meshes of the ligamentum pectinatum and are seen within and surrounding some venous bloodvessels running backwards into the scleral tissue.

The pigment epithelium of the iris is quite irregular in outline, some parts are thinner than normal and others appear con-

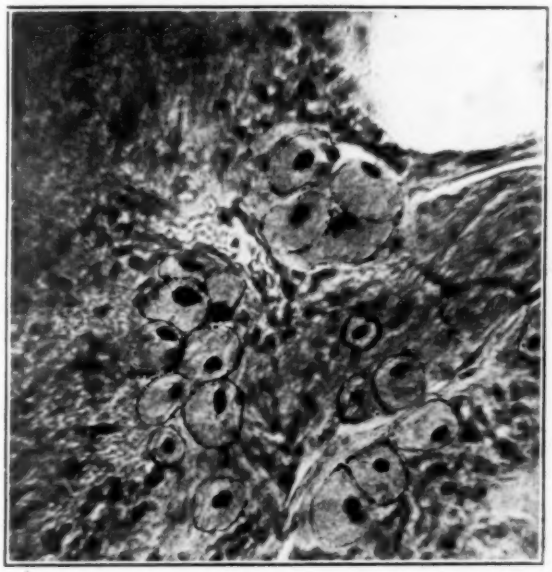

Fig. 3. Epithelial cells in anterior part of ciliary body. To make them better recognizable some of the large cells have been outlined with ink on the photograph before reproduction.

siderably thicker and in some places there are isoluated pigmented microscopical tumors.

Similar large round pigment bodies lie between the ciliary processes, and the pigment epithelial layer of the latter shows irregularities as does that of the iris. In parts it appears broader and in others very much thinner than the average and in places it seems wanting.

I have of late made it a practice to bleach a number of sections of every pathological eye I have examined and am satisfied that if this were done systematically by every pathologist we would gain considerably in our knowledge of the epithelial and pigmented connective tissue cell changes in the eye. Since I

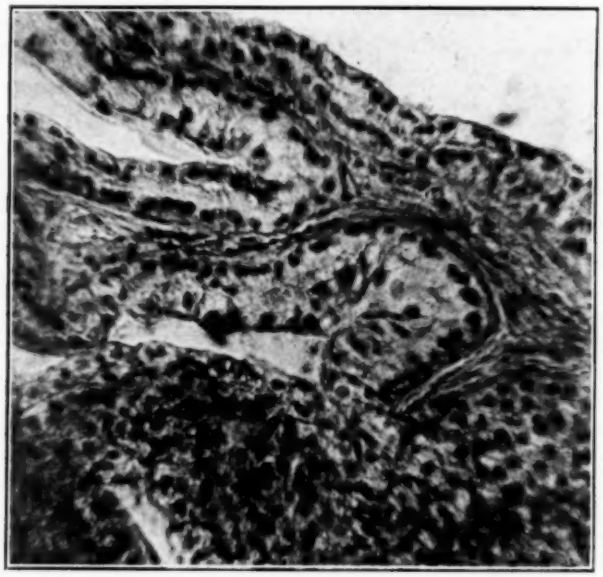

Fig. 4. Degenerating cells of the epithelial lining of the ciliary processes.

have first employed Alfieri's method about a year ago, I have employed it always, because it does not in any material way alter the tissues nor destroy the cementing substance as calcium

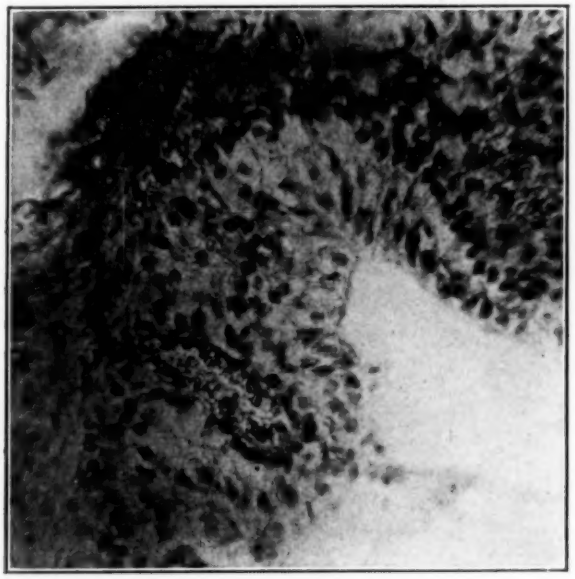

Fig. 5. The same as Fig. 4 from another part of the ciliary body.

chloride will do. To obviate this latter and frequently raised objection to the calcium chloride bleaching process (Tr. Collins), I have learned by experiment that it is best to let the absolute alkohol almost totally, but not quite, evaporate from the section and then cover this at once without any other clearing agent with the cover glass to which a drop of Canada balsam dissolved in xylol is applied. By this method I have succeeded in most cases in getting perfect specimens and the parts will not fly apart.

Fig. 6. Degenerating epithelial cells just behind the root of the iris on the anterior apex of the ciliary body. Sclerocorneal tissue on the right side with atrophic iris periphery attached.

The Alfieri method is a nicer one and allows of perfect staining. The latter is a great advantage over the calcium chloride method. Yet, in some very darkly pigmented eyes I have found it impossible to remove the pigment altogether, although it was always possible to see the nuclei and other details.

In the examination of the eye under consideration the bleaching process promised to reveal things which without would be unrecognisable. I therefore bleached the large majority of the sections and found the interesting conditions detailed in the following:

The large round bodies of pigment wherever they were situated when bleached were seen to be enormous round cells with a round or oval nucleus. Only where these cells were exposed to pressure as between iris periphery and corneoscleral tissue did they assume a more irregular shape. Those of these cells lying in the iris angle and on the posterior surface of the cornea where

Fig. 7

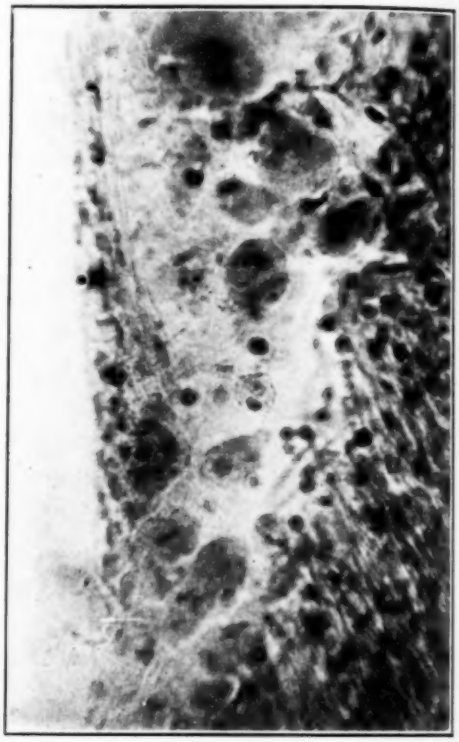

Fig. 8

Fig. 7. Portion of ciliary body perfectly denuded of epithelial covering, numerous cells lying nearby in the act of being washed away.

Fig. 8. Part of Fig. 7 considerably enlarged.

mixed with some mononuclear leukocytes (Fig. 2). At first I thought that these large cells were phagocytes filled with pigment, but their whole appearance and shape reminded me so much of epithelial cells that I gave up the former idea and tried to find their origin. I had in a number of specimens before this not infrequently seen pigment epithelial cells wandering through the cells of the pars ciliaris retinæ, and when they had reached the vitreous body or the posterior chamber assume just such a round

shape when released from the pressure of the neighboring cells. I, therefore, first explored the ciliary body and its processes. Here I found that the anterior parts of the ciliary body just behind the iris periphery contained nests of these large round cells which corresponded to deeply pigmented parts in the unbleached section (Fig. 3). Furthermore, in numerous sections the pigmented and unpigmented epithelial cells of the ciliary body were transformed into large vesicle-like cells and thus not only was the regular double row of nuclei normally covering the ciliary processes correspondingly greatly altered, but close to such places large numbers of these cells were found lying

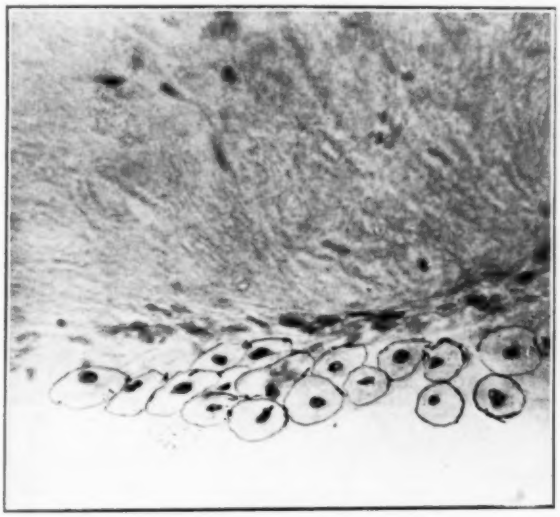

Fig. 9. Posterior epithelial covering of iris degenerating and partly ready to be washed away. The cells outlined with ink.

in the vitreous body or the posterior chamber (Figs. 4, 5 and 6).

On hunting further I found large areas of the ciliary body which were absolutely denuded of epithelial cells, the shed cells, the same large round cells, lying close by between the fibres of the suspensory ligament or in the vitreous body (Figs. 7 and 8). Such a degree of desquamation of the epithelial covering of the ciliary body I have never seen before.

It seemed, from all this, clear that the deposits in the anterior chamber consisted of these desquamated epithelia of the ciliary body.

However, I found on further study, that the epithelial covering

of the posterior surface of the iris also played a part in their production.

I found numerous places in which the iris epithelium showed the same vesicle-like enlarged cells and nearby some large round cells which had fallen off, while others evidently were just in the act of doing so (Fig. 9).

The little microscopic tumor like swellings on the posterior surface of the iris, mentioned above, proved also to consist of epithelial cells which were changed into such vesicle-like cells and formed larger accumulations, probably before becoming detached later. (Fig. 10.)

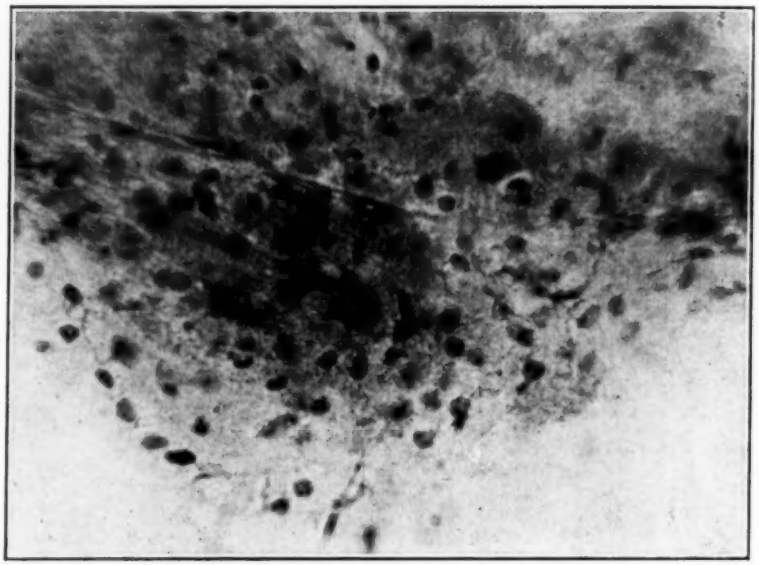

Fig. 10. Tumor-like accumulation of degenerating epithelial cells on the posterior surface of the iris. The dilatator is seen as a line of long spindle cells. Some large epithelial cells lie in the iris tissue in front of it.

The epithelial covering of the posterior surface of the iris, therefore, also shares in this pathological process which seems to be characteristic of the affection.

Other changes found in this eye show nothing peculiar and may therefore be omitted.

Whether this is a peculiar case by itself or whether it can be looked upon as furnishing the explanation of what has clinically been termed serous iridocyclitis, I can, of course, not undertake to say. It seems, however, that the tedious and long drawn

out process of absorption of the deposits on Descemet's membrane, even when no secondary glaucoma results, may well be explained by the epithelial character of the cells of which they consist. On the other hand the plugging of the meshes of the filtration angle with these epithelial cells is the natural explanation of the secondary glaucoma.

Only once before have I examined an eye in which the bottom of the anterior chamber was absolutely filled with such large epithelial cells which apparently had also come from the ciliary processes, but the case was complicated by an injury with infection from without, and can therefore not be compared with the one here detailed.

I have not been able to find in the literature a description which tallies exactly with the conditions in this eye. Both Ginsberg and Parsons mention desquamation of the epithelial cells of the ciliary body as occurring in cases of iritis serosa and iridocyclitis, but their descriptions are not such as to lead me to understand that they have seen anything nearly like what I have here described. It is, of course, just barely possible that no eye similarly afflicted has, like mine, been examined at what is perhaps the most favorable moment and not at a later period when other changes have occurred which might hide the conditions I have seen.

DIONIN IN THE TREATMENT OF IRITIS.

Charles Wray (*Brit. Med. Jr.,* July 21, 1906,) calls attention to a possible bad effect following the use of dionin in iritis. He used a 5 per cent. solution of this drug in a case of serous iritis where the pupil was fairly well dilated by atropin and in about fifteen minutes found the pupil contracted to the size of the pupil in the other eye, which was not under the influence of atropin. Atropin and cocain used alternately for several hours failed to dilate the pupil again, although it did dilate subsequently without any evil consequences. He emphasizes the importance of not giving the patient, with iritis, this remedy to use at home without first knowing its effect on that particular eye, as otherwise the pupil might contract and posterior synechiæ form before the patient was again seen. He notes the fact that Dr. Suker, of Chicago, had reported a case where dionin had produced extreme myosis and two days later pronounced synechiæ were found.

ON A METHOD FOR IMPROVING THE VISUAL ACUITY OF ALBINOTIC EYES.

By Professor Komoto,

TOKIO, JAPAN.

(Translated from Klin. Monatsbl. fuer Augenhlkn., May-June, by Adolf Alt, M.D.)

Although a great deal has been written concerning albinotic eyes, as far as I know, thus far nothing has been tried to remove the dazzled vision peculiar to them and to improve their visual acuity. At least, I have been unable to find anything on this subject in the leading text-books. Since the dazzling and the accompanying reduced visual acuity are due to a large extent to the abnormal permeability of the walls of the eye for light rays, a certain advantage could be expected from the injection of India ink under the conjunctiva bulbi. It is really astonishing that thus far such an experiment has not been made, but it may be explained by the fear of a resulting cosmetic detriment. It is, also, possible that nobody thought of it, as it is the rule not to meddle with such congenital anomalies.

Last year an albino was sent to me with the earnest prayer to do something to improve his visual acuity since his father wanted to make a mechanic of him. I resolved to try whether a subconjunctival injection of India ink, and possibly also tatooing the margin of the cornea through the exclusion of the light entering through the sides, would not produce the wished for improvement. There is little to be said on the technique of this procedure. I only call attention to the fact that cases are known in which India or ordinary ink got under the conjunctiva during an injury and remained there visible for a long time. I made the injections first in the upper part of the conjunctiva and then with a few weeks interval in different directions, once or twice according to the result obtained. Even after the first injection a remarkable improvement occurred both as to the dazzling and to the visual acuity. Tatooing the cornea I refrained from after one single experiment, since it was difficult of execution and proved useless.

If such blackened eyes should appear too ugly, an indifferent white substance, say carbonate of lead, might be tried, which also would reduce the transparency of the sclerotic. Before making such an attempt on the human eye, I tried it on rabbit's eyes to see how it would be borne. It caused a slight inflammation at the site of the injection which, however, subsided within a week and

left a yellow swelling which was little different from the color of the surrounding tissue. After this I made a copious injection of such a lead emulsion under the previously loosened conjunctiva of the left eye of the patient. The subsequent inflammation was trivial and shortlived, but the therapeutic effect was very small.

It would, perhaps, be possible to inject lead and India ink together, or the latter after the former, which would render the color much less black. Another means to render the blackness of the eyes less conspicuous might be to lessen the size of the palpebral fissure by a tarsorraphia externa.

Since, as I believe, the albino's skin of the lids is also more transparent, I have injected India ink both into the upper and lower lid, after which the patient thought that there was certainly less dazzling. The discoloration was confined to the lid margins and appeared light blue. Before relating the case history of my albino I want to state the result of my treatment. When I stopped treating him the dazzling was greatly diminished, so that the patient could remove the cap in the room which formerly he was wont to wear always. The visual acuity was greatly improved from fingers at 5 feet to 20/50.

History.—Takenowuzi, 16 years old, father and mother healthy, grandparents were blood relations, parents also distantly related. Patient is the third son out of 9 children; no similar anomaly in the family, but all of the boys have a more or less impeded speech and are slightly idiotic. Aside from measles, the patient has never been seriously ill. The white color of the skin and hair was noticed by the parents at birth and he was always so dazzled that he could recognize people's features at a very few feet only.

Entered the clinic November 25th, 1905.

Status praesens.—Patient of medium development but normal; hair and skin perfectly white, skull a pronounced saddle head.

There is slight nystagmus of both eyes, no other anomaly of motility, iris perfectly white and beautifully transparent, fundus light red of the typical albinotic kind, lens and vitreous body normal. Visual acuity very poor, counts in daylight fingers at 5 feet only. In the evening with a low lamplight he can count fingers at 8 feet.

Operation, R. E.—On December 2nd, 1905, I tatooed the margin of the cornea, after which he counted fingers at 6 feet; however, on account of the technical difficulties I did not repeat this

procedure. December 20th, first injection of India ink under the upper conjunctiva bulbi, after which acuity was somewhat improved; on January 20th, 1906, second injection under the other parts of the conjunctiva, repeated on February 17th. Now V. had risen to 20/200. I then injected India ink under the skin of the eyelids, which raised V. to 20/70. A further subconjunctival injection raised V. finally to 20/50.

L. E.—In this eye I tried, as stated above, the injection of lead carbonate under the conjunctiva. After a slight reactive inflammation he counted fingers at 6 feet. Since another injection brought no further improvement, I changed to India ink and with several injections in this eye also, produced a visual acuity of 20/50. Further treatment of the eyes was made impossible by the sudden death of the patient from kakke; yet, I hardly expected any further improvement of vision since it is rather impossible to diminish the transparency of the iris as tatooing the corneal margin is very difficult of execution.

I should like to add to this communication—since it might not prove uninteresting to the European colleagues—how many albinos I have seen in Japan. During almost 20 years of practice I have seen only 4 albinos in almost 150,000 patients, two men and two women, in one of the latter the albinism was not complete. I may add that I have recently found from an old manuscript that in the 9th century a report was sent to the government from the province of Kishiu concerning two albinos (brother and sister) as something very extraordinary.

In conclusion I may be permitted to call attention to the fact that in the way I have shown, an improvement of the visual acuity and of the most harassing dazzling from which albinotic eyes suffer, can, perhaps, be produced.

TUBERCULOSIS AS ÆTIOLOGY OF CHRONIC INFLAMMATIONS OF THE EYE AND ITS ADNEXA, ESPECIALLY OF CHRONIC UVEITIS.

By W. Stock, M.D.

(Graefe's Archiv. LXVI, I, p. 1.)

CONCLUSIONS.

(Translated by Adolf Alt.)

By means of the inoculation of pure cultures of the tubercle bacillus into the blood of rabbits I have succeeded in producing in the eyes of such animals alterations in many points similar to those observed in the human eye in chronic uveitis. I have seen: a *chronic iritis* with nodule formation, a *cyclitis,* and a *disseminated choroiditis.* From a pathological anatomical standpoint the findings in all of these alterations are not typically tubercular. However, the fact that tubercle bacilli were found in the sections and in lesions reproduced by inoculations, makes it certain that these alterations can have been produced only through the agency of the tubercle bacilli.

Aside from these I have produced a *scleritis* and a *sclerosing keratitis.* Both of these affections resulted from a primary tubercular choroiditis and cyclitis. Small nodules in the *conjunctiva* and a chalazion-like *tuberculosis of the tarsus* have also been produced by a hæmatogenous process.

Starting from these experimental studies I tried to ascertain in how far tuberculosis must be looked upon as an ætiological factor in the production of chronic iritis in man. The experimental transplantation of pieces of iris into animals' eyes remained without result in 15 cases, as also the inoculations with aqueous humor. But, I believe, that we have in the tuberculin reaction (T. v.) a diagnostic means which should be employed in every case of chronic uveitis.

If the patient does not react and if another ætiology (rheumatism, lues, etc.) can be found, then, of course, the iritis cannot be looked upon as tubercular. If a rheumatic or luetic patient reacts we have to accept this ætiology as the most probable one and arrange our treatment accordingly. If this, however, proves unsuccessful, we can conclude that the chronic iritis is due to tuberculosis and arrange the therapeutic measures accordingly.

If a patient reacts locally, or when with a general reaction *small often barely visible nodules* with a grayish cover or only thickenings of the iris within the small iris circle can be found by means

of the binocular loupe, I consider the process as undoubtedly tubercular. These small *nodules* in the *small iris circle,* which, as I said, can only be seen with a binocular loupe, when there is a general reaction to-tuberculin (T. v.), I look upon as characteristic of tuberculosis. Not only did such nodules appear in a great many cases after the experimental blood inoculation with tuberculosis in animals, but I, furthermore, have never seen them in iritis due to any ætiology other than tuberculosis. I am especially certain that the specifically syphilitic eruptions on the iris are easily differentiated from these small nodules. Syphilitic eruptions in the iris are always accompanied by great irritation of the whole eyeball, with the small tubercular eruptions there is often not even a slight circumcorneal injection present. Furthermore, syphilitic papules are reddish brown, whilst these little nodules can just be discerned from the surrounding tissue as little grayish discolorations. However, every case of chronic iritis must be *repeatedly examined* with the binocular loupe.

The pathological anatomical examination of eyes removed on account of chronic iridocyclitis has not with certainty revealed tuberculosis (I could not find any bacilli). Yet the number of such eyes so far examined is not sufficiently large. It is, therefore, of especial interest to carefully examine every such eye anatomically. It will, probably, with the modern technique of imbedding be as possible to find bacteria in some of the cases, as it was with my experimental material. None of my eyes were very fresh, some had been in Mueller's fluid for 20 years.

When in a given case of chronic iridocyclitis the opinion is established that the ætiology is tuberculosis, tuberculin (T. R.) is to date still by far the best and most certain remedy in our possession.

The fact that we produced with one injection of tuberculin (T. v.) a local reaction in cases in which the eyes showed no recent alterations, can be explained only by assuming that the morbid process was in abeyance, that the tubercle bacilli were encapsuled in the tissue. Thus the relapses of such an affection can be understood; through some cause the encapsuled bacilli are freed and at once new inflammatory symptoms come into appearance.

I thus believe to have by this labor increased our knowledge concerning tuberculosis as an ætiological factor in chronic uveitis. I do not think it a pure accident that I had the necessary material at my disposal in a sufficient quantity; for I believe with

Michel and Axenfeld that the frequency of this affection is bound to the territory from which my material came. While in Northern Germany—I know the material at Rostock and Breslau—the chronic iridocylitis, and, more especially the disseminated choroiditis is relatively rare; it is, for instance, at Freiburg and Tuebingen and probably also at Wuerzburg almost of daily occurrence. Axenfeld (cf. Dissertation of Baum) has tried to draw certain conclusions by comparing the death statistics of tuberculosis of Rostock with those of Freiburg. He could ascertain that tuberculosis is rarer at Rostock than at Freiburg i. B. From my small numbers, I cannot decide whether the frequency of chronic iridocyclitis depends on that of general tuberculosis. Whether, however, this is the case or not, whether local dispositions also play a role in it or not, does not alter the fact that at Freiburg a large number of eyes destroyed by chronic uveitis are in reality destroyed by tuberculosis.

Thus these studies again admonish us, the oculists, to take part in a larger measure in the fight against tuberculosis, so that these sad cases of chronic uveitis, which thus far mostly lead to prolonged suffering and often to blindness, may disappear from our practice.

THE THIRD EYELID.

William Robertson (*Brit. Med. Jr.*, Jan. 13, 1906,) describes what he terms "a perfect example of that rare vestibium, a third eyelid." The condition was found in a male Indian of Dravidian stock, who appeared otherwise entirely normal, physically. The supernumerary eyelid was beneath the right upper lid and, when the eye was in the primary position, protruded about 2mm. beyond the margin of the proper lid, thus leading to its discovery. This exposed part was darker than the rest of the structure which was nearly the color of the conjunctiva and normally sensitive to the touch. Cartilaginous in appearance, of the thickness of a sixpence, it lay closely over the globe without fold or wrinkle on either surface, having a clean cut margin at its periphery, and evenly and completely followed the movements of the upper lid.

Robertson thinks the case a striking proof of the evolutionary element in Nature, it being an example of the plica semilunares or membrana nictitans which divides the conjunctival sac into two parts in birds and reptiles.

A CASE OF STREPTOCOCCIC CONJUNCTIVITIS.

By H. H. B. Cunningham, M. D., F.R.C.S.I., M.R.C.S.ENG.

Ophthalmic Surgeon, Ulster Hospital, Belfast; Honorary Demonstrator of Anatomy, Queen's College, Belfast.

Conjunctivitis due to a pure or almost pure streptococcic infection does not appear to be a common disease, and in view of the virulence of the affection and the unfortunate termination of the case here recorded, one is thankful that these cases are not more numerous.

A. F., aged 2 years, was brought to the hospital on March 12th, 1907, the mother stating that the child had suffered from a sore eye (left) for the previous three weeks; the lids were glued together on some mornings, but this was not a marked symptom. There was an eruption on the face, dry in character, situated on the forehead, cheeks, and chin, which the mother stated had been there before the eye became affected. On examining the eyes, the right eye and its appendages were apparently healthy; on the other hand, there was a slight œdema of the left lids, palpebral conjunctivitis, but not very marked, and very slight injection of the ocular conjunctiva. The cornea and iris were healthy. There was a large swelling on the left side of the neck involving the parotid area, at first sight resembling the enlargement of the parotid gland seen in specific parotitis, but there were no symptoms of this disease present. The swelling had been there for three weeks and its appearance seemed to coincide with that of the sore eye, though this could not be definitely ascertained, the swelling was fairly hard, solid, and not painful on palpation, the preauricular gland was not enlarged, but a number of enlarged, hard, discrete glands were felt in the posterior triangles of the neck. There were no *Pediculi capitis*. The child was said to be "not so well" for the last two days, being somewhat drowsy. Two other children in the house were said to have been affected with "colds in their eyes," previous to the present child being affected. No history of tuberculosis nor of syphilis was obtained.

The case was treated as a catarrhal conjunctivitis, and ordered frequent application of boracic lotion, the glands in the neck being looked on as that type of tuberculous adenitis so common in these children. Three days later the child was seen again, when the enlargement of the lymphatic glands and the swelling in the region of the left parotid gland were in a similar condition to that described above, the eruption in some parts of the face was

becoming purulent, but now there was marked œdema of the left eyelids, which were a little red in color, and which were markedly swollen; the palpebral conjunctiva was much injected, and the ocular conjunctiva was in a state of chemosis; on separating the lids muco-purulent discharge was found in the palpebral sac, the cornea and iris were clear and apparently unaffected. The right eye was not affected. Frequent application of warm boracic lotion to the eye and face, to be followed by boracic ointment, was ordered. Four days later the child was again seen, when the glandular enlargements were unaltered, the eruption on the face was less and cleaner, the œdema of the lids was a little decreased, but they were still red. On separating the lids free muco-purulent discharge was seen, being in greater quantity than on the previous date; the chemosis was marked, the whole of the cornea was cloudy; there was a large deep central ulcer in the cornea, with shreds of fibrinous lymph adherent to it, and which had apparently perforated, though this could not be made out with certainty owing to the chemosis and œdema of the lids, and the struggling of the child. There was also a large hypopyon half filling the anterior chamber, and the eye was lost.

A swab was taken from the palpebral sac, which, both under the microscope and in culture, gave the typical appearances of streptococci and that in almost pure culture.

This is a case which in its earlier appearances did not differ very materially from the ordinary acute catarrhal conjunctivitis due to Weeks' bacillus, and one often sees these cases complicated by œdema of the lids and chemosis. Again, as there was a semi-purulent eruption on the face, an auto-inoculation at once suggests itself. Against this is the fact that the right eye was not affected during the whole course of the disease, and one would have expected to have found it implicated both in such a condition, and sooner or later in a Weeks' conjunctivitis; and further, in a purulent skin eruption it is usual to find more than one variety of micro-organism, and one would therefore expect to find some, at any rate, of these micro-organisms in an inoculation conjunctivitis.

This would, then, appear to be a streptococcic conjunctivitis *per se,* and which is evidently a rare disease, for many of the text-books on ophthalmology make scanty reference to streptococci in their descriptions of conjunctivitis, and do not describe a similar condition to that given above; for example, Fuchs[1] only quotes Morax as stating that streptococci are found in cases of

catarrh accompanied by lesions of the lacrimal sac. Inglis Pollock[2] on examining bacteriologlically 362 cases of conjunctivitis only found the *Streptococcus pyogenes* in three cases, of which one was a case of ophthalmia neonatorum with Neisser's diplococcus, and the others were two oldstanding cases of blepharitis marginalis in which large numbers of organisms, staphylococci, air bacilli and several indefinite bacilli and diplobacilli were found as well. This case does not appear to resemble that rare disease, Parinaud's lacrimal conjunctivitis, which is a streptococcic conjunctivitis, usually unilateral, in which there is swelling of the lids, and of the conjunctiva, especially the ocular; but also in which there is only *slight* secretion, the preauricular as well as the cervical glands are enlarged and tender, and in which the lacrimal sac is implicated; thus differing from the case described above. The enlargement in the parotid area and of the cervical glands suggests that type of conjunctivitis[3] described by Parinaud in 1889 and which now bears his name; but in this disease, which is unilateral, granulations are found in both fornices; there is no suppuration in the conjunctival sac, though the enlarged preauricular gland frequently breaks down and suppurates, and in which bacteriological investigation up to the present has been unable to describe the offending micro-organism.

Is an endogenous streptococcic conjunctivitis possible or probable in such a case as this? One doubts it. Parsons[4] describes a pseudo-membranous form as a group of streptococcic conjunctivitis more frequently met with than Parinaud's lacrimal conjunctivitis, and in which the eye is frequently lost through corneal ulceration; he states that Coppez has collected thirteen cases from the literature, and quotes Uhthoff as stating that the association of membranous conjunctivitis with impetigo of the face, in which latter condition large numbers of streptococci are present, is well known. Therefore, although no membrane or pseudomembrane was seen in the case described above, one is inclined to place it in the category of those mentioned by Uhthoff.

In conclusion, I would like to thank Dr. Wilson, of Queen's College, for kindly examining the swab for me.—*Brit. Med. Jour.*

References.

1 Textbook of Ophthalmology, by Fuchs; second American edition; 1905, page 48. 2 Inglis Pollock. Transactions of the Ophthalmological Society of the United Kingdom, vol. xxv, p. 32. 3 Parinaud's Coniunctivitis, by Andrew Little, Ophthalmoscope, December, 1906, p. 681, and Textbook of Ophthalmology, by De Schweinitz, p. 290. 4 Pathology of the Eye, by Parsons, vol. i, p. 38.

MEDICAL SOCIETIES.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Meeting held at Edinburgh, May 25th, 1907.

The President, Mr. Priestly Smith, in the Chair.

CARD CASES AND SPECIMENS.

A Case of Lenticonus Posterior (*right eye*).—Dr. George Mackay and Dr. W. B. Mackay.

The patient was a girl, aged 8. The right eye presented no appreciable corneal astigmatism by ophthalmometer. Fundus normal. Lens practically transparent, but on minute inspection exhibiting towards the periphery some extremely fine striation. Shadow test revealed marked myopic movement slightly to the nasal side of the centre of the pupillary area, surrounded by a dark shadow ring of denser shade and less mobility than that which is usually seen around a corneal conus. With a stenopæic aperture of about 4 mm. in diameter the myopia appeared to measure about 15 dioptres at the summit of the cone. Subjectively she preferred—10 D sph. but vision could not be improved to more than counting fingers at 2 metres. No appearance of a hyaloid artery, nor of opacity in the vitreous. The outer part of the lens appeared to have approximately normal refraction. Left eye, vision c+1 D sph.=6/9 partly and J1. There is little to be gleaned from the family history. Parents seem to have good vision and do not use glasses. Paternal grandfather has cataract and other paternal relations are myopic.

A Peculiar Form of Recurrent Conjunctival Nodule.—Dr. George Mackay.

Miss A. O., aged 29. Seen first March, 1906. At the age of 17, after measles, developed a symmetrical swelling at outer side of each globe near corneal limbus. Dr. Maddox excised each of these. After that the nodules were no longer evident, but a grey crescent gradually formed at the corresponding part of the

neighboring cornea like a small segment of an arcus senilis. In March, 1905, swelling recurred at inner side of left eye. In May, 1905, came to Royal Infirmary, Edinburgh, and Dr. J. V. Paterson excised it. Section said to have shown small round-celled infiltration with fine reticulum, no giant cells.

Eyes remained fairly well until winter 1905-6, when recurrence in both eyes and frequent pain made her seek advice again. Weak yellow oxide of mercury and cocain ung. night and morning was ordered. Made good progress all through the summer so that the *right* eye was practically well (except for arcus) by November 27, 1906. *Left* eye only affected at outer side.

March 2nd, 1907. Complains of occasional sharp pain in left eye, which at present shows a smooth, flattened, slightly pinkish swelling at outer side of cornea, rising abruptly above the general level of the conjunctiva. The appearance does not admit of a diagnosis of phlyctenulæ, of spring catarrh, of fibroma or more malignant tumor. Vision unaffected.

Traumatic Arterio-venous Aneurism of Right Orbit, with Pulsating Exophthalmos.—Dr. George Mackay.

J. S., aged 31. In July, 1905, was thrown from a carriage on his head. Unconscious for about 8 hours. On recovering felt great pain in head, especially beneath left parietal bone, and whistling noise in both ears. At first appears to have had large extravasation behind the globe. It pulsated and he was unable to shut the eye. Vision was dim. He had diplopia. The prominence has gradually diminished but sight has not improved. The noise has remained constant. In December, 1905, patient noticed the left eye was getting dim.

Seen first on February 15th, 1906. The right eye was obviously proptosed. Paralysis of sixth nerve. Distinct pulsation of the globe. The veins at the root of the nose and about right eyebrow dilated and thickened. Congestion of the post-conjunctival vessels. He could now close the lids completely. The pupil reacted to light and accommodation. Pulsation in the orbit immediately succeeding the apex beat. Bruit audible over a large area of head and neck, its area of maximum intensity being at the root of the nose and round the right eye. The *left* eye not protruded and its muscular movements normal. No pulsation visible. The pupil acted to light and accommodation. The left fundus showed slight congestion of the veins and there was some cloudiness of both discs.

R.V.=Fingers at 2½m. L.V.=Fingers at 4 m.

Treatment. Iodide of potassium, rest and local compression.

May 3rd, 1906. Seen as out-patient. RV.=Fingers at 3½m. L.V.=6/36. Right fundus, veins tortuous, disc congested; movements of right eye good except outwards. Continued to improve without operation and returned to his work.

April 17th, 1907. Re-admitted on account of proptosis and distension of external vessels increasing.

May 25th, 1907. Exhibited for suggestions as to surgical treatment.

Dr. Mackay also exhibited:—

Hyaloid artery. An elderly man with a persistent exsanguine hyaloid artery extending from the disc to the centre of the posterior capsule of the lens. Fundus otherwise healthy. Media transparent.

Tumor of orbit, probably sarcoma. A woman, A. G., aged 42. When first seen a decided proptosis was the only pathological sign. Under prolonged application of X-rays and subsequently high frequency current for several months, the proptosis receded and appearance became almost normal. After neglect of treatment for about a year patient returned with more pronounced proptosis and nodular swelling to be felt occupying especially the outer part of the orbit. No alteration of the fundus of the eye. External muscular movements and pupillary action well performed. No diplopia. Is again under treatment by high frequency, but Krönlein's operation recommended.

Exostosis of orbit. An infant with left congenital ptosis, paresis of upward movement and slight divergence apparently associated with exostosis at the nasal side of the left orbit.

A test object for illiterates. Discs whose surface was evenly chequered with black and white squares were used as the test object. The distance at which it became evident that the surface was chequered and not a uniform grey gave a measure of the patient's visual acuity. With young children the patient was given two discs similar to the test object, one chequered, the other grey, and was asked to indicate which corresponded to the test.

A loupe for the use of myopes. The loupe as ordinarily used, viz., nearer the object than its focus, gives a *virtual* and *erect* image, but is unsuitable for the uncorrected myopic eye. Held further from the object than its focus it gives a *real, inverted* image, and this arrangement is available for myopes. A second,

weaker, lens may be placed between the eye and the loupe, giving greater magnification and less spherical aberration. The book must be held upside down in reading.

Case of Congenital Anophthalmos.—Dr. Sym.

The second child of the family, aged 12 weeks, female. The parents not consanguineous. Father a congenital deaf-mute. Mother a deaf-mute since early childhood.

The palpebral apertures are extremely small, and even on separating the lids with a hook no trace of globe can be made out on either side. There is no cyst of the lids. The eye lids, though very small, are correctly formed, and are provided with a fair growth of eye lashes; the orbital ridges are very feebly developed and the eyebrows were non-existent, but are now appearing. Tears are secreted freely. In other respects the child seems correctly developed.

Case of Unusual Pigmentation of Sclerotic.—Dr. Sym.

This patient, an elderly woman, presented herself on account of an accidental traumatic rupture of the left eye several days ago. On enquiry she stated that the "white" of this eye had all her life been deeply tinted, that of the right eye not at all. In both eyes she had suffered severely as a child from keratitis.

Nearly the whole visible sclerotic, but chiefly the inner and lower-inner part, was deeply tinted of a blackish color. The iris was not specially dark; not darker than that of the other eye. The aspect at first suggests argyria, but the hue is not quite the same, and the palpebral conjunctiva is entirely unaffected.

Chorio-vaginal Veins.—Dr. Sym.

There was visible in the left eye of a boy of 8 a large venous trunk collecting blood from the choroid and entering the sheath of the nerve to the upper outer side of the disc, but not visible on the disc itself. The fundus generally was pale (poor pigmentation of choroid) but there was no myopia and no staphyloma.

Congenital Error in Ocular Movements. Faulty Attachment of Internal Rectus.—Dr. Sym.

The left eye of this girl is in a condition of slight exophthalmos and of (chiefly latent) hyperphoria. She complains of more or less constant diplopia. On asking her to follow an object moving to her right along a horizontal plane, one observes the left eye after a time to cease almost completely to move to the right, but to rise higher and higher.

There is no apparent paralysis of any ocular muscle. It is to be noted that it is when the internal rectus is called upon to act alone that the faulty movement is executed.

Double Enucleation for Glioma Eighteen Months Ago.—Dr. Sym.

Enucleation was performed in December, 1905, of the right eye, on account of glioma; within a week it became evident that a similar growth was present in the left eye and was growing rapidly: this was at once enucleated also. At that time the child looked very weak, thin, puny, and delicate. A year later she was a plump, bright, healthy-looking girl. At this date it is eighteen months since the double enucleation.

A further point of interest is that the eldest child in this family of six was also the subject of glioma.

Preparations of the two eyes of the child were also shown.

Case of Reticular Keratitis.—Dr. J. V. Paterson.

Mrs. B., widow, aged 48, was first seen on 30th April, 1907. She complained of dimness of vision, especially in the left eye; no pain, but occasional sensation of a foreign body in the left eye. History quite unimportant; has enjoyed excellent health. No other member of family available for examination.

Appearances. L. E. Irregular, wavy, grey, branching, anastomosing lines, forming an irregular meshwork over the surface of the cornea. Towards the centre of the cornea the lines are somewhat broader and cause a denser opacity, and in this area there is a faint general haze. The epithelium over the lines appears œdematous or stippled. The lines can be traced nearly, but not quite, to the corneal margin. The opacity appears to be placed very superficially. There is no sign of vascularization recent or old. The eye is free from congestion and the fundus normal. V.=6/18 vix.

R. E. Shows the same appearances, but developed to a much less extent. V. with +0.5 cyl. axis horiz. =6/9.

Patient with Tuberculosis of Conjunctiva of Left Upper Lid. Treatment by Excision of Diseased Tissue and Grafting.—Dr. J. V. Paterson.

A girl of 16, of a healthy family and showing no other signs of disease. Seen first in December, 1906. Conjunctiva of left upper lid was at that time greatly thickened and showed numerous yellowish nodules, but was not ulcerated. On the lid margin a very small abrasion or ulcer was present. Pre-auricular gland enlarged and tender and some swelling of glands in parotid

region. History of close association with a friend suffering from chest disease, so that this small ulcer may have become the seat of inoculation.

Diseased tissue excised down to tarsus and graft applied taken from upper arm. A minute subcutaneous nodule excised at same time.

Structure of diseased tissue removed was typically tuberculous, and the bacillus in small numbers was demonstrated in the sections.

The Sinuous Lid Border: a Sign of Trachoma.—Lieut.-Col. H. Herbert.

Lieut.-Col. H. Herbert showed photographs illustrating the changes in curvature which the border of the upper lid undergoes in cases of trachoma. The most usual effect produced is that the inner portion arches upwards while the outer half shows a convexity downwards, and it was found that this change was most marked in those cases where corneal complications were present. The reason of this is that the corneal inflammation induces blepharo-spasm, and the action of the orbicularis being more marked in the outer half of the lid than the inner leaves this latter part comparatively free to swell and become convex downwards.

A Collapsible Apparatus for Testing the Field of Vision.—Dr. Arthur Sinclair.

This apparatus consists of a specially constructed disc-shaped screen of over 20 inches radius, which collapses on the umbrella principle, and has, in addition, a perimeter arm, so that it can be employed either for Bjerrum's method or for the more accurate measurement of the visual field in a fixed position.

Glaucoma with Charts.—Dr. Arthur Sinclair.

This was a case in which, with extreme contraction of the visual fields, the central vision was still perfect. The tension was +½ in both, and the optic dics exhibited well-marked cupping.

A Case of Retinitis Punctata Albescens.—Dr. Arthur Sinclair.

This was a case of retinitis showing curd-like deposits, which Dr. Sinclair thought might be related to the disease mentioned above.

(a) *Tuberculous Tumor affecting both Sixth Nerve Nuclei and causing Paralysis of Conjugate Deviation on both sides.*

(b) *Tumor of Sylvian Grey Matter involving Third Nerve Nucleus causing Bilateral Paralysis of Vertical Movements.*—Dr. Alexander Bruce.

Dr. Robert Fleming showed microscopical specimens of Optic Neuritis due to intracranial tumor, with special reference to the changes in the neuroglial cells.

Dr. E. Bramwell showed a brain with an occipital abscess from a case in which epileptic fits were preceded by a visual aura, and where hemiachromatopsia developed. He also showed a case of ocular palsy due to congenital absence of cranial nerve nuclei.

Dr. Maitland Ramsey showed an opaque projector for teaching purposes.

PAPERS.

The Pathology of Rupture of Descemet's Membrane.—Mr. George Coats.

After touching on the history of this lesion, which was first described microscopically by Becker in 1875, and again by Haab in 1899, by whom it may be said to have been first recognized clinically, Mr. Coats described the results of his own observations based on the pathological examination of 13 cases, and exhibited lantern slides to demonstrate the microscopical changes. These splits are most commonly found in cases of buphthalmos, where the eyeball is enlarged generally; they are uncommon in cases of uncomplicated myopia since the enlargement under these circumstances takes place towards the posterior pole only. The ruptures occur most frequently in the periphery of the cornea and are usually placed transversely. In some cases the membrane has only become extremely thin and has not completely given away, but more frequently and typically the free ends of the ruptured membrane are very distinct and separated by a definite interval. Often they are somewhat curled up. The endothelium may or may not give way over the rupture; if it does so it is very actively regenerated, insinuating itself into any place where a gap has been formed, and eventually laying down a new elastic membrane. However perfect the repair may be, the edges of the split are generally visible owing to the heaping up of homogeneous substance at the coiled-up ends. Attempts made to produce rupture of Descemet's membrane experimentally in the eyes of young rabbits did not prove successful, owing to the fact that the globe gave way at the equator before any changes occurred in the corneal substances; but if the membrane was scratched previously

to the production of distension then many of the features seen in ruptures of the membrane were produced. Erdman, in 1906, produced experimentally ruptures of Descemet's membrane (amongst other changes) by electrolyzing the aqueous in rabbits.

Observations with Rayleigh's Apparatus for Color Mixing.—Dr. Edridge-Green.

Dr. Edridge-Green examined 38 people with Rayleigh's apparatus, and gave tables of his results. He showed that there were considerable differences in the way in which people were able to match the colors. This was due not to any physical condition present, but could be readily explained physiologically in accordance with the author's theory of color vision.

A Histological Demonstration on the Third Nerve Nucleus.—Dr. Alexander Bruce.

Dr. Bruce exhibited with the lantern a series of sections showing the various parts of the third nerve nucleus and its relations.

(a) *Notes on the Comparative Anatomy of the Eye.*—Dr. Leslie Buchanan.

The highest type of eye, as exhibited in all vertebrates and some invertebrates, is so arranged that an image of an external object is formed in the eye and transferred thence to the brain. The ocular apparatus, as it exists in some invertebrates, was described and demonstrated by means of microscopic sections thrown on the screen. The *octopus* has a lens and iris as in man, but the main difference is that the bacillary layer is pointed inwards and not outward. The *clam* has a lens which is not adjustable, and the iris is replaced by a ring of pigment developed in the integument and surrounding the cornea, so that evidently a comparatively imperfect image is formed on the retina. The *spider* possesses no special lens, but the shape of the cornea is bi-convex. In the *caterpillar* the eye is a dermic structure, about 1/350 inch in diameter; the cornea is formed from the horny layer of the skin and the internal structures are developed from true skin. There is a kidney-shaped lens but no well-developed retina. In the *house fly* and the *bee,* the cornea is multiple, each division measuring 1/1000 inch in diameter; there are 1,000 such areas and each area is a bi-convex or plano-convex lens. Lying immediately behind each of these little lenses is a structure comparable to a retinal cone, and from this cone passes backwards, through a diaphragm of pigment, a single fibre, all the fibres ulti-

mately uniting to form a nerve. This arrangement probably contributes to great accuracy in the matter of perception of direction. The *snail* has only light perception, possessing only a central lens surrounded by pigmented fibres which serve the purpose of retinal elements, while in the *Australian mole* and the *leech*, we find a lower type still, the eye merely consisting of a few pigmented cells which respond in some way to the stimulus of light.

(b) *Case of Rupture of the Pectinate Ligament.*—Dr. Leslie Buchanan.

In March, 1903, Dr. Buchanan brought before the Society an account of the pathological examination of 5 eyes in which rupture of the pectinate ligament had occurred as a result of injury caused by blunt instruments. Two further cases had recently come under his notice, one of which forms the subject of the present paper. The history of these cases in general convinced him that this injury inevitably leads to loss of the eye.

J. C., aged 59, was struck in the left eye with a broom handle on June 29th, 1906; the pain was severe, there was a wound of the conjunctiva on the nasal side, the cornea was hazy, the pupil was dilated and appeared drawn to the nasal side; the iris was tremulous, the anterior chamber shallow at the nasal side but not on the temporal; the tension was increased; the fundus was dimly seen through hazy media, but no gross lesion was apparent. In the course of the next few months the media cleared so that the lense could be seen lying free and the retina became visible with a +12, the iris was retracted further to the nasal side and a large ectasia of the sclerotic developed above; the pain was severe and the tension +2; vision was barely perception of light. The other eye became irritable so that in January, 1907, the exciting eye was excised.

Pathologically an ectasia was found on the superior and nasal border of the cornea, and another on the temporal side of the globe near the equator; the optic disc was deeply cupped and the pectinate ligament was ruptured, the ciliary body and iris having slipped backwards for about 1mm.

The Present Position of the Spirochaete Pallida in relation to Syphilitic Affections of the Eye.—Mr. Sydney Stephenson.

The history of the discovery of the organism by Schadinn and Hoffman 2 years ago, was reviewed; and after comparing it with other organisms not capable of being cultivated outside the body,

Mr. Stephenson emphasized the definite diagnostic importance at the present time of the finding of the spirochæte pallida, the clinical evidence as to specificity being grouped under 3 headings:—(1) The discovery of the spirochæte pallida in the healthy eyes of fœtuses and of infants which have died from congenital syphilis. (2) Its discovery in lesions set up experimentally in the eyes of animals by inoculation of syphilitic material, such as chancres or diseased glands. (3) Its discovery in actual syphilitic invasions of the human eye.

With regard to the evidence under the first heading, the organism has been found in practically every part of the eye by Stock, Peters, Römer, and Han Bab, the latter of whom published a paper on the subject in November, 1906; and the contention that the so-called organism was only an artefact is refuted by the fact that the spirochæte has also been found in the blood.

Secondly, experimental inoculations have been made by various observers into the cornea, iris, and anterior chamber, and in some cases the spirochætes were found, especially if microscopical examinations were made early enough, but not in advanced cases.

With regard to observations under the third heading, very few have been recorded; only four positive cases have been described, viz.: by Kowalewski, zur Nedden, Kruckmann, and by Mr. Stephenson himself. The latter also found them in a case of keratomalacia when he used the Giemsa method of staining.

In the discussion which followed, Mr. Coats observed that great caution was necessary before definitely deciding that one had the spirochætes in any smear preparation.

Treatment of Secondary Capsular Cataract.—Dr. Angus McGillivray.

It was pointed out in this paper that the causes of inflammatory reaction, after the operation of needling, were four in number, viz.:—sepsis, undue wounding of the vitreous, prolapse of the vitreous, and dragging on the peripheral attachment of the membrane. The risk of using Bowman's double needle operation was the risk of septic infection, and there was also fear of prolapse of the vitreous, while the difficulty of placing the opening where the operator wanted it was considerable. The operation he recommends is done with a needle knife having a slightly upturned point. It is entered subconjunctivally at the lower inner periphery of the anterior chamber, and after piercing the membrane at its upper outer margin, is made to divide it by a series of

small sawing motions as it is withdrawn. The aqueous is retained during the operation by the cylindrical stem of the knife.

In the subsequent discussion opinions were expressed mostly as to the direction of the rent in the capsule; some (*e.g.*, the President) advocating horizontal division. Col. Herbert and Mr. Doyne emphasized the importance of early needling, while Dr. Sym advised the removal of a piece of anterior capsule at the time of the first operation, by which means he considered that needling would be rendered unnecessary.

A Storage Battery for Ophthalmic Use.—Dr. Angus McGillivray.

This was a portable apparatus which cost £3, and could be used for electrolysis, electro-cautery, electro-magnet, and electric light. If properly attended to and not allowed to run down too far or discharged too rapidly, the battery will last 3 or 4 years, after which time new plates and solution are needed.

A Case of Parinaud's Conjunctivitis, with Pathological Report.—Dr. Arthur Sinclair and Dr. Theodore Sherman.

A man, aged 61, painter's laborer, was first seen with conjunctivitis of the left eye in July, 1906. Three weeks later swelling of the pre-auricular gland on the same side occurred, and subsequently the sub-maxillary and cervical glands became enlarged. The formation of nodules in the conjunctiva and suppuration of the swollen glands made Parinaud's conjunctivitis the most probable diagnosis.

The patient, after being under observation four months, disappeared, though not completely recovered.

The pathological changes were found to affect the epithelium and the sub-epithelial tissue. The former was thinned, especially where it covered large collections of plasma cells, and the cells of the deeper layers were either separated by fluid, atrophied, or showed vacuolation. The sub-epithelial tissue was crowded with plasma cells; they were found in greatest numbers round the blood-vessels, and became larger and more characteristic towards the surface of the membrane. Some of them were degenerating and becoming transformed into hyaline bodies. There were also more lymphocytes than usual found in the blood-vessels. In one part of the section there was some localized necrosis.

Bacteriologically, 2 varieties of staphylococcus albus were separated from the conjunctival erosions, and, as a result of experimental investigations on the rabbit, it was thought that they had some direct influence in the causation of the disease. This led to

the adoption of treatment by vaccination. The patient, however, did not remain long enough under treatment for any definite result to be obtained.

A Case of Telangiectases of the Retinal Capillaries or Venous Radicles.—Dr. W. B. Inglis Pollock.

John W., aged 53, stone-mason. Two years ago, while at work, he suddenly became aphasic, and this was followed the next day by an attack of slight hemiplegia with diminution of sight in the right eye. There is no history of syphilis, and the urine is normal, but the patient has aortic disease, and it is therefore probable that the attack was due either to thrombosis or embolism.

R.V 6/60, L.V. 6/12, pupils equal and active and the visual fields full.

Ophthalmoscopic examination of the right eye shows the optic disc normal, arteries sinuous, and the veins slightly turgid but not tortuous; the macula is deeply pigmented. Pathological changes are confined to the first and second temporal branches of the superior vein of the retina. These vessels have their walls thickened and sclerosed in places, and some have been converted into white bands. Several of the radicles entering these veins come from convoluted vessels which are directly continuous with the arteries.

In addition there are four groups of massed convolutions, here termed telangiectases. They look like hæmorrhages but have scarcely changed in the course of six months. Careful inspection shows the presence of small vessels in them, especially at the margins. They lie in the plane of the retina. The changes appear to be the result of thrombosis of the superior temporal vein occurring two years ago.

Frost has depicted similar structures in "The Fundus Oculi," pl. xl., fig. 91, but his case apparently went on to retinitis proliferans.

MALCOLM L. HEPBURN.

PRELIMINARY PROGRAM OF THE 12TH ANNUAL MEETING OF THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY, TO BE HELD AT LOUISVILLE, KY., SEPT. 26, 27, 28, 1907.

OPHTHALMOLOGIC SECTION.

Address: Eye Symptoms of Intracranial Complications of Otitic Origin.—Dr. R. A. Reeve, Vice-President, Toronto, Can.

1. Ocular Symptoms in Intra-Cranial Complications of Otitic Disease.—Dr. Percy Fridenberg, New York City.
2. Insufficient Pigmentation as a Cause of Eye Diseases.—Dr. Chas. E. Woodruff, Platsburg, N. Y.
3. An Inquiry into the Refractive and Pathological Conditions of the Eyes of Old Soldiers, with Reference to the Frequency and Kind of Diseases to which they are Subject: With Special Reference to the Relation of these to Cataract.—Dr. D. W. Greene, Dayton, Ohio.
4. The Treatment of Incipient Senile Cataract.—Dr. L. A. W. Alleman, Brooklyn, N. Y.
5. Angiosclerosis of the Eye.—Dr. Robert Scott Lamb, Washington, D. C.
6. Glaucoma After Cataract Extraction.—Dr. Albert E. Bulson, Fort Wayne, Ind.
7. Magnetic and Non-Magnetic Properties of Iron Alloys.—Dr. Mortimer Frank, Chicago.
8. A Further Study of the Horopter.—Dr. George C. Savage, Nashville, Tenn.
9. Defects of Abduction Associated with Retraction of the Globe in Adduction.—Dr. John Green, Jr., St. Louis, Mo.
10. Advancement Versus Tenotomy.—Dr. C. Barck, St. Louis, Mo.
11. The Relative Importance of the Fitting of Glasses in Ophthalmic Practice.—Dr. Linn Emerson, Orange, N. J.
12. Methods of Illuminating Test-Type Charts.—Dr. Nelson M. Black, Milwaukee, Wis.
13. Treatment of Partial Optic and Retinal Atrophy by Electricity and Massage.—Dr. H. V. Würdemann, Milwaukee, Wis.

14 Remarks on Vibratory Massage in Eye Diseases.—Dr. Leartus Connor, Detroit, Mich.

15. Can a Substitute for Simple Enucleation be Employed in Every Instance?—Dr. George F. Suker, Chicago.

16. Glioma Retinæ, with Report of a Binocular Case Cured.—Dr. Charles Lukens, Toledo, Ohio.
17. Dilatator Pupillæ.—Dr. Adolf Alt, St. Louis, Mo.
18. Corneal Lesions Dependent on Accessory Sinus Diseases.—Dr. H. Manning Fish, Chicago.
19. Some Experience with Simple Glaucoma. With Conclusions Therefrom on the Relative Value of Operative and Non-Operative Treatment.—Dr. H. B. Young, Burlington, Ia.
20. Ocular Manifestations of Nephritis.—Dr. J. O. McReynolds, Dallas, Tex.
21. A Study of Refraction Based on Four Thousand Cases.—Dr. J. F. Byington, Battle Creek, Mich.

At a recent meeting of the Berlin Ophthalmological Society Professor Hirschberg gave an account of what he described as the oldest existing illustration of an operation for cataract. The Greeks, he said, had illustrated works on medicine and science, of which very few have survived. Of five treatises on diseases of the eye that are known to have existed, none have come down to us. Between A.D. 870 and A.D. 1370 the Arabians produced at least thirty textbooks of ophthalmology of which thirteen are still extant. Hunian gave the first picture of the eye, Salah-addin reproduced ophthalmic instruments, such as a syringe for the suction of soft cataract, besides optical figures and a cross-section through the eye. As the Mohammedan religion, however, forbids the representation of the living body, this author gives no illustration of cataract extraction. Halifa, who flourished about 1255, gives illustrations of about thirty-six eye instruments. The later Persian writers give no illustrations, and Salomon of Toledo gives none of cataract extraction. In regard to this the Middle Ages are blank up to the seventeenth century. The first author to give an illustration of cataract extraction was George Bartisch, but, according to Professor Hirschberg, he made the same blunder that was made by Rembrandt in his picture of Tobias healing his father of blindness; he shows the operator's left hand, not fixing the eye-ball, but resting on the forehead. In an edition of his book published one hundred and three years later, the same mistake is again made. The first who gave an accurate representation of the procedure was Lorenz Heister in 1713.